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Patent claims

- 5 1. An arrangement for sensing a frontal impact of a motor vehicle (1), wherein a plurality of impact sensors (10) which are connected to a control device (3) are integrated into a bumper (13) of the motor vehicle (1) and the impact sensors (10)  
10 each comprise first contact sensor elements (15) which face the front (12) of the vehicle, and second contact sensor elements (16) which face away from the front (12) of the vehicle, which are each arranged spaced apart from one another  
15 essentially in the longitudinal direction of the vehicle and by means of which an acceleration signal or speed signal can be generated when a vehicle impact occurs, characterized in that the contact sensor elements (15, 16) constitute units  
20 which are respectively separate from one another and between which a free cavity (18) which forms a measured section is provided.
- 25 2. The arrangement as claimed in claim 1, characterized in that the cavity (18) which forms the measured section is surrounded by a foam-like shaped part (19).
- 30 3. The arrangement as claimed in claim 1 or 2, characterized in that the contact sensor element (15), respectively lying on the outside, of the impact sensor (10) is arranged on an outer skin (20) of the bumper (13).
- 35 4. The arrangement as claimed in one of claims 1 to 3, characterized in that the bumper (13) is a front bumper of the motor vehicle (1), and the contact sensor element (16), respectively lying on

the inside, of the impact sensor (10) is arranged on a front crossmember (11) of the motor vehicle.

- 5        5.    The arrangement as claimed in one of claims 1 to 4, characterized in that the impact sensors (10) each form separate units in terms of their arrangement on the bumper (13).
- 10       6.    The arrangement as claimed in claim 1 or 2, characterized in that the impact sensor (10) is arranged in a hollow strip (21), at least partially extending over the width of the motor vehicle, on an outer skin (20) of the bumper (13).
- 15       7.    The arrangement as claimed in one of claims 1 to 6, characterized in that the impact sensors (10) are embodied as optical waveguides, piezo-electric sensors or a force-dependent resistor (FSR).
- 20       8.    The arrangement as claimed in one of claims 1 to 7, characterized in that a time difference between a first impulse against the respective first contact sensor element (15), lying on the outside, and a second impulse against the respective second  
25       contact sensor element (16), lying on the inside, is measured in order to generate the acceleration signal or speed signal.
- 30       9.    The arrangement as claimed in one of claims 1 to 8, characterized in that, when an impulse is applied, the contact sensor elements (15, 16) output, to the control device (3), a voltage signal or a change in resistance which correlate with a contact force which exerts the impulse.
- 35       10.   The arrangement as claimed in one of claims 1 to 9, characterized in that the control device (3) outputs an activation signal to safety devices

(17) of the motor vehicle (1) as a function of whether the acceleration signal or the speed signal exceeds a predefined threshold.

5 11. The arrangement as claimed in claim 10,  
characterized in that in each case a threshold is  
assigned to a defined accident threshold, and the  
activation signal is output to a safety device  
10 (17) which is assigned to the respective  
threshold.

12. The arrangement as claimed in claim 10 or 11,  
characterized in that the safety devices (17)  
comprise pedestrian protection devices (19).